Making your own future : expectations and occupation choice

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Making your own future. Expectations and occupation choice*

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Abstract

The choice of a university career has a major saying in the future earnings and career opportunities of the individuals. In turn, prospective university students make their decisions mainly motivated by expectations of future rewards. Hence, understanding career choices requires, first, to be able to understand the expectations that students have. Second, it is necessary to increase our knowledge about the timing and the source of information about wages and other forms of rewards. Taking these prerequisites into account, this paper attempts to increase our understanding of the motivations that students have and the perceptions they form when confronted with the occupation choice. Based on a survey to prospective university students in Argentina we will first show how a seemingly homogeneous population exhibit different perceptions and goals. Secondly, we explore the influences and sources of information and actions that these individuals have used to decide their future specialization. Finally, and referred to the occupation rewards, we show that it is possible to aggregate individuals according to their motivations, showing that it is necessary to include in our analysis information and expectations about aspects different from future income streams. This will prove to be of fundamental importance in the attraction of students to technical and scientific related disciplines.
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1 Introduction

The choice of a university career is a major determinant in the future earnings and career opportunities of individuals. In turn, prospective university students make their decisions mainly motivated by expectations of future rewards (i.e, earnings, work opportunities and stability and social rewards). Individuals'

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choices on education are inevitably made under conditions of uncertainty, and thus expectations on consequences are essential input in the decision process (Schweri, Hartog and Wolter, 2009). In addition, abilities and previous training together with family background influence the choice of field of studies.[1]

Arcidiacono et al. (2010) highlights that one of the key problems when economists implement models of economic choices is the absence of data on the constructs of such models. Hence, it is required to make strong assumptions about how students form expectations for earnings across the different available options in order to estimate their choice models. Manski (1993) mentions that skeptical of the reliability of subjective expectations data, and given the lack of an appropriate methodology for incorporating these data in the estimation of their models, most economists have avoided their use. Instead they have chosen to rely on assumptions about the expectations formation process implicit in the specification of their decision model.

Hence, a popular approach among economists has been to infer students' expectations from realizations by assuming a homogeneous expectations formation process.[2] As reviewed by Manski (1993), researchers have assumed either myopic or rational expectations. In the former case, students enrolling in higher education form their expectations by looking only at the realized income distributions of earlier cohorts. In a series of publications, Freeman (1971, 1975a, 1975b, 1976) applied the cobweb model, with its inefficient enrollment response to wage shocks, to enrollment in numerous fields. In the case of rational expectations, students assess incomes for their cohort properly, by taking the repercussions caused by changing supply of and demand for skills into account. In both cases they may have unconditional expectations —concerning the mean earnings of their cohort— or conditional ones, which relate more specifically to their own personal characteristics and abilities. Whereas conditional expectations are relevant for the personal career decisions of the prospective college student, unconditional expectations can be useful to test the respondent's general knowledge of the labor market and its developments. An alternative is the collection of data on expectations directly from students. There is a small literature in this area that collects either conditional (on individual characteristics)

[1] Studies that explicitly consider that factors such as the abilities and 'interests' of individuals include as classic examples Fiorito and Dauffenbach (1982), Gambetta (1987) and Gordon (1973). Relatedly, sociological research on educational inequality rests on the belief that children of different classes and origins have different perceptions of the costs and benefits associated with specific educational choices (van de Werfhorst, 2002). When choosing, individuals are influenced by the probability of success, the costs of failure and their idiosyncratic resources and costs. All these factors are individual-specific and depend on family background and the transfer of specific social capital endowment for the child (see, for example, Bourdieu and Passeron, 1964). Tacsir (2010a) provides a summary on the effect of family background on the field of study of the young individuals.

[2] As pointed out by Dominitz and Manski (1996 and 1997), a researcher seeking to learn expectations from realizations must assume that he or she knows what information the household or individual possesses and how this information is used to form expectations. Misspecification of the information set or expectations formation process is likely to lead to incorrect model estimates. Additionally, Manski suggests that it is necessary to measure the extent to which knowledge of the labor market is homogeneous among students.

expectations (Smith and Powell, 1990; Blau and Ferber, 1991; Dominitz and Manski, 1996), or unconditional expectations (Betts, 1997).[3]

Taking these comments into account, this paper contributes to a better understanding of the motivations that students have and the perceptions they form when confronted with occupation choice.[4] Based on a survey to prospective university students in Argentina we will first show how individuals can be characterized in dimensions that are believed to affect their occupation choice: opinions about the role of higher education, factors that influence success in life, parents' involvement (Section 2), sources of information and actions performed to decide what to study (Section 3) and their assessment of the rewards and requirements enjoyed by some paradigmatic careers —law, engineering and science and technology related fields— (Section 4). The second part of this paper shows, in Section 5, the results of clustering individuals —based on multiple correspondence analysis of the students' expectations— according to their attitudes towards pecuniary and non-pecuniary rewards about their career choices. This section shows, first, that it is necessary to include in our analysis information and expectations about aspects different from future income streams. Or, said differently, we will show that some individuals take into account dimensions related with other rewards (such as social value and/or labour stability) as the relevant dimensions for deciding. Secondly, we will include the individual's characterization presented in the first part of this paper and will discuss its relevance and influences. In doing so we will characterize the influences that using different sources of information and performing different actions have when individuals decide their future specialization. This will allow us to show the influence that parents, professors and educational institutions have in directing young individuals towards different fields of study. At the same time, the evidence presented here will allow us to understand some of the reasons behind the decreasing interest in technical and scientific related disciplines.

1.1 Processing information: role of perceptions

The specific economic benefits, as well as the wider non-economic benefits, of a higher education are now widely recognized by policy makers and increasingly by the general public. Even when certain segments of the population may be quite aware of the return on investment on higher education, there are questions about the accuracy of awareness among the population that makes up the bulk of people considering post secondary education —namely, youth, especially high school students. For example, Usher (2005) reports that in Canada most people overestimate the short-term costs of university in relation to the long-term benefits by a factor of five. Those from lower income families have the most serious misperceptions, to the point that they typically think the costs outweigh the

[3] A related question concerns when and how students acquire information about wages and other forms of rewards. Betts (1996) suggests that one would expect the marginal value of information to be greatest in the early years of study, before sunk costs created by study in field-specific courses make it costly for a student to switch fields.

[4] An important contribution in this same line is Easterlin (1995).

benefits.[5]

Individuals make rational decisions based on the information available to them; however, rational decisions made with bad data can lead to results that might appear irrational to the observer. An increasing amount of evidence suggests that "popular knowledge" of the costs and benefits of higher education are drastically out of kilter with reality, making higher education seem far less financially attractive than it actually is. Indeed, the extent to which perceptions differ from reality would appear to be so large that they may form a separate form of barrier to education all on their own. Evans (2002) suggests that this rationality only operates "within people's (existing) horizons and social norms". In other words, what matters in decision making is not what is actually true, but what one believes to be true. It follows from this that individuals do not conduct cost-benefit analyses based on actual costs and benefits of post-secondary education, but rather based on its perceived costs and benefits. This represents a sort of "bounded" cost-benefit analysis. Cost-benefit analysis using only actual costs may be fine in an abstract sense, but will not yield insights into the actual decision-making process particularly given the evidence that considerable gaps exist between perceptions and reality in this area (Usher, 2005).

This raises the larger question about the role of perceptions in educational and career decision-making. Whether accurate or not, perceptions do influence decision-making. Looker and Lowe (2001) state that if a high school student, and her/his parents, believe that the cost of post-secondary education is beyond their means, or only have information of rates of return to specific post-secondary programs, is this partial picture (and not the whole allegedly complete information) that gets built into their decision-making. In this sense, it is plausible to believe that policies oriented simply towards the provision of information will tend to be ineffective in attracting individuals towards specific disciplines in shortage. If the heterogeneity in the population produces heterogeneous results in terms of how individuals process the available information (corresponding to the average individual) we rather need to devise policies oriented towards enhancing the processing information of underprivileged groups.[6]

2 Data description and main characteristics

The data presented here arise from a specially designed survey that was conducted during the first week of November 2008 to individuals enrolled in their final year of secondary school in the province of Río Negro, Argentina. Confronted with the need to decide what they would do in the near future,[7] the different interviewees were asked to indicate their future plans from a list of four

[5]For more information in this respect, see Canada Millennium Scholarship Foundation (2006 and 2008).

[6]This is of specific importance in a context —as reported by Grubb (2002)— where counselors many times tend to transmit stereotypes and negative biases against science and technology disciplines.

[7]The school year in Argentina finishes in early december. Generally, university freshmen start their studies in mid-March.

possible options: to attend university, follow tertiary non-university studies, go directly to the job market or have not decided yet. Those who indicated that were continuing their studies in the university — this being the majority — were asked about their perceptions on a list of different university careers and the one of their choice. This characterization of alternative careers included beliefs about the wages of the graduates, the social value of the different professions, their opinion about them and the likelihood of obtaining a job easily after graduation. Those interviewees that were about to start their university studies and fully answered the characterization of the different careers reached 299 cases. These are the data that we use in the remainder of this paper.[8]

Table 1 describes the main characteristics of the sample used here. In general terms, the data serve as a good representation of the total population of new enrollments in the country —for more information in this respect, see Tacsir (2010a). However, this sample presents a bigger proportion of individuals graduating from technical tracks at the secondary schools and of prospective students in Science, Technology and Engineering (ST&E) related fields. As we showed elsewhere (Tacsir, 2010a and 2010b) these two biases are heavily related.

Basic characteristics of the surveyed individuals		
a. Personal characteristics		
Gender	Female	53.2
	Male	46.8
b. Educational history		
Type of school	Public school	64.9
	Private school	35.1
School track	Non technical education	60.3
	Technical education	39.7
Performance in maths	Low	34.9
	High	65.1
Performance in language	Low	20.3
	High	79.7
c. University plans		
Field of Science	Applied sciences	30.4
	Basic sciences	7.4
	Health sciences	17.7
	Humanities & social sciences	44.5
Type of career	Non ST&E	69.9
	ST&E	30.1
d. Family background		
Mother's education	Without higher education	49.2
	With higher education	50.8
Father's education	Without higher education	57.2
	With higher education	42.8

Table 1: Main characteristics of the survey respondents. In percentages.

[8]Tacsir (2010b) uses a less restrictive dataset constructed from the same survey.

2.1 Opinions about higher education and success

This section aims at characterizing the interviewed individuals in terms of factors that we consider have an important influence in the occupation choice. Namely, we focus on the reasons for studying at the university, parents' involvement and concern, characteristics that a university career should meet to be considered attractive and, factors explaining success in life.

Why to study? The interviewees were asked to indicate from a short list the main reason why their parents would want them to attend the university. The majority (80.7%) indicated that it is because university education allows better jobs. Obtaining better social standing and allowing higher wages were only indicated by a small group (11.4% and 9.7%, respectively). In general, these opinions are robust to the different characteristics of the individuals. However those that followed a technical track during their secondary school and those individuals whose mothers had not completed tertiary education emphasize more strongly the advantage that education provides for better jobs (significant at the 5% level). Female interviewees and those who attended private schools tend to indicate more frequently the advantages provided in terms of social standing. Nevertheless, in these cases the differences found are not statistically significant.

What makes a career attractive? Taking into consideration that all of our interviewees were (allegedly) engaged in activities related with choosing a university career, we asked them to identify from a list of possible factors the one feature that a university career should have to be attractive to them. The options that were more frequently signaled are those related to pecuniary/labor market characteristics: providing higher wages (22.9%) and allow flexibility to work in different occupations (22.6%). After these, we find contributing to society and promoting the use of creativity. Obtaining social recognition was mentioned by 9.1% of the respondents. Intellectual challenges closes the list. This ranking is quite robust by gender, type of school (public or private), track of schooling (non technical or technical) and family background (maximum level of education of both parents).[9] Table 2 presents the results.

What makes you successful? Different social and human sciences will probably disagree on the objective measure for success in life. Most likely economists will use some measure of income or wealth, sociologists will assess the membership to specific classes or forms of capital and psychologists will consider some measure of life satisfaction or happiness. Despite the existing differences, they all will agree in pointing out that achieving success requires consciously transforming certain inputs (such as time, intelligence, effort) and/or received capital (i.e., social class, wealth, social networks, education) into some sort of assets

[9] Male respondents are more likely to emphasize the use of creativity as the main factor behind their interest —together with higher wages. In turn, females' motivation is related with the intellectual challenges. In both cases these results are significant at the 1% level.

Main feature of an attractive career	
Features	Frequency
High wages	22.9
Flexibility	22.6
Contribution to society	19.5
Use of creativity	17.5
Social recognition	9.1
Intellectual challenge	8.4
Total	100.0

Table 2: Main characteristics of the survey respondents. In percentages.

(money, membership to a certain group, satisfaction with the decision, etc.) for which individuals are believed to be assessed by self and peers.

Without any intention of closing the debate about the determinants of individual success or satisfaction, we asked our interviewed individuals to indicate in terms of relevance different factors that might be considered drivers of individual success. Here, we presented them with a list of factors that combine some that go beyond the control of the individuals (like social origin, gender) with others that are dependent on personal decision and choices (effort, career, etc.).

Taking into consideration the large share of interviewees that will follow university studies, it isn't a big surprise to find that the most important factor behind individual success is to have attended university.[10] Intelligence and the chosen profession follow in importance. At the same time, the expectations about social mobility and a meritocratic society are palpable when we observed that neither social origin nor access to contacts are considered determinant of the individual performance. Table 3 summarizes this information.

2.2 Parental involvement

Since the United States Department of Health, Education, and Welfare commissioned in 1966 a study to assess the availability of equal educational opportunities –the "Coleman report"—, innumerable studies have aimed at weighting the influences of family factors on educational outcomes. More recent contributions have drawn a line between the so-called family status factors and family process factors (Xia, 2010). While the former refers to those characteristics that define what families are (race, income, parental education social class and family structure), the latter concentrates on what families do. In here, we can

[10]Traditionally, access to university in the country is equated with social mobility. Two factors have a fundamental importance in this respect: studying has no costs and admissions in most of the cases only require the student to have finished secondary studies with no disciplinary restrictions. Then, at the national level, we observe that a large proportion of those that have finished high school have started university studies (34.5%), this figure rising to (63.2%) for the younger population (20 to 30 years old). Similarly, for Río Negro the proportions are 39.6% and 53.6%, respectively.

		Importance of different features and decisions to be successful									
		University		Intelligence		Profession		Contacts		Social Origin	
		Low	High	Low	High	Low	High	Low	High	Low	High
a. Personal characteristics											
Gender	Female	10.8	89.2	29.7	70.3	27.2	72.8†	54.0	46.0	62.7	37.3‡
	Male	15.8	84.2	30.9	69.1	39.6	60.4	54.4	45.6	77.0	23.0
b. Educational history											
Type of school	Public school	14.7	85.3	30.0	70.0	29.5	70.5	51.4	48.6	69.9	30.1
	Private school	10.1	89.9	33.3	66.7	32.3	67.7	56.6	43.4	66.7	33.3
School track	Non technical education	10.6	89.4	32.9	67.1	32.3	67.7	54.1	45.9	65.3	34.7
	Technical education	17.0	83.0	28.6	71.4	27.7	72.3	51.8	48.2	74.1	25.9
Performance in maths	Low	9.8	90.2	32.3	67.7	30.4	69.6	50.0	50.0	64.7	35.3
	High	15.2	84.8	27.9	72.1	34.7	65.3	55.3	44.7	71.6	28.4
Performance in language	Low	11.9	88.1	33.9	66.1	32.2	67.8	50.9	49.1	72.9	27.1
	High	13.4	86.6	28.5	71.5	33.6	66.4	54.3	45.7	68.1	31.9
c. University plans											
Type of career	Non priority	12.0	88.0	28.7	71.3	27.8	72.2‡	53.1	46.9	65.5	34.5†
	Priority	15.6	84.4	33.3	66.7	44.4	55.6	55.6	44.4	77.8	22.2
d. Family background											
Mother's education	Without higher education	11.6	88.4	33.3	66.7	27.2	72.8†	54.4	45.6	59.9	40.1‡
	With higher education	14.5	85.5	27.0	73.0	38.2	61.8	53.3	46.7	78.3	21.7
Father's education	Without higher education	14.4	85.6	31.5	68.5	26.7	73.3†	52.7	47.3	26.7	76.3†
	With higher education	12.8	87.2	26.6	73.4	40.4	59.6	55.0	45.0	40.4	59.6
Total		**13.0**	**87.0**	**30.1**	**69.9**	**32.8**	**67.2**	**53.8**	**46.2**	**69.2**	**30.8**

Table 3: Factors that determine success in life by main characteristics of the interviewees. In percentages. Significance levels for the χ^2 test for independence or two independent sample t-test:: * 10%, †5%, ‡1%.

include parental expectations and beliefs, parental involvement, parenting and disciplinary practices.[11,12] Here, we asked our interviewees about three possible ways of parental involvement: help received during their studies, parental awareness about their performance in school and, finally, concern about this performance. Table 4 presents this information.

Generally speaking, we observe that both gender and type of school play an important role in parental involvement. Specifically, females' parents know about and are concerned the performance while males' parents not, at least according to the students' perceptions. Again, knowledge and concern for those attending private schools is higher than for those in public schools. Interestingly, the level of assistance reported by our respondents is not different by gender or across types of school. Individual performance is loosely related to parent's involvement. Specifically, those who self-reported a higher level of maths indicated that their parents tend to know more about their performance at school. In addition, those in the group of top performers in language declare that their parents care more. About their track at secondary school, there are no statistical differences for any of measures of parental involvement used here.

In this sense, we find that parental education attainment is inversely related with their involvement. Those parents who tend to help, know or care more about performance are those with the lower educational levels. Finally, and in relation to their future study plans, we observe that prospective students of natural and basic sciences stand out in receiving less help. At the same time, those oriented towards health sciences are closely followed by their parents, while the individuals aiming for a degree in social sciences seem to be the group inducing the lowest levels of concern among parents.

3 Sources of information and actions

Information about education and occupation choices is supposed to be widely available. However, two important issues arise. First, when confronted with

[11] Research suggests that parental encouragement has two dimensions. The first is motivational: Parents maintain high educational expectations for their children. The second is proactive: Parents become involved in school matters, discuss college plans with their children, and might save for future university expenses (either direct costs in the form of tuition and materials or indirect costs in the form of monthly endowments). Development and maintenance of postsecondary education aspirations among high school students is proportionally related to the frequency and consistency with which parents provide encouragement.

[12] In particular, parental involvement stands out as the most researched family process factor, producing a multitude of conceptual frameworks to account for the phenomenon. Despite the significant amount of research, the field has not produced clear and consistent results. The factor that has shown the most consistent effects is parental expectations, many times operationalized as the level of information about their own performance. At the same time, an important number of studies found that student achievement was positively associated with parent-child discussions about experiences and academic matters (Keith et al, 1993; Sui-Chu and Willms, 1996, to name a few) and parental involvement in children's learning at home (Derrick and Lewis, 2001; McWayne et al, 2004). On the other hand, some studies highlighted the negative effects of excessive parental control such as close supervision of homework or frequent contacts with school or parent-teacher conferences (see Xia, 2010, for a review).

Parents involvement, knowledge and concern on the interviewees' performance							
		Help received		Awareness level		Concern level	
		Low	High	Low	High	Low	High
a. Personal characteristics							
Gender	Female	53.3	53.2	46.8	59.1†	43.9	58.4†
	Male	46.8	46.8	53.2	40.1	56.1	41.6
b. Educational history							
Type of school	Public school	65.2	64.7	70.1	60.0	73.0	60.4
	Private school	34.8	35.3	29.9	40.0*	27.0	39.6†
School track	Non technical education	59.1	61.1	59.8	60.7	58.0	61.5
	Technical education	40.9	38.9	40.2	39.3	42.0	38.5
Performance in maths	Low	36.1	34.1	43.1	27.8	34.9	34.9
	High	63.9	65.9	56.9	72.3‡	65.1	65.1
Performance in language	Low	21.0	19.8	20.4	20.1	17.5	21.8
	High	79.0	80.2	79.6	79.9	82.5	78.2
c. University plans							
Field of Science	Applied sciences	30.4	30.5	34.0	27.1	31.5	29.8
	Basic sciences	11.2‡	4.6	8.3	6.4	7.4	7.3
	Health sciences	13.6	20.7	13.9	21.3*	10.2	22.0‡
	Humanities & social sciences	44.8	44.3	43.8	45.2	50.9*	40.8
Type of career	Non priority	65.6	73.0	67.4	72.3	67.6	71.2
	Priority	34.4	27.0	32.6	27.7	32.4	28.8
d. Family background							
Mother's education	Without higher education	44.8	52.3	43.7	54.2*	33.3	58.1‡
	With higher education	55.2	47.7	56.3	45.8	66.7	41.9
Father's education	Without higher education	50.5	62.2*	56.0	58.5	44.7	64.6‡
	With higher education	49.5	37.8	44.0	41.5	55.3	35.4
Family income	In Argentinean $	4,973	4,324	5,189*	4,055	5,655†	4,003

Table 4: Parents' involvement and influence on the interviewees' performance on secondary school. In percentages. Significance levels for the χ^2 test for independence or two independent sample t-test:: * 10%, †5%, ‡1%.

the decision about whether to continue studying and what to study, youngsters are presumed to compile and process numerous sources of informations, while taking into account suggestions from teachers, friends, counselors and family members. It is this combination of information and personal experiences that shapes individuals' perceptions about the cost, opportunities and expected advantages of different options. Resulting from this particular set of information, a decision is made. Secondly, it is important to note that different individuals may not interpret it in the same way. Information which is not considered authoritative may not be taken into account and the authority of information varies from group to group — a special problem in dealing with diverse groups with their own norms including teenagers, minority communities, ethnic communities including recent immigrants, sometimes rural communities, certainly aboriginal communities (Grubb, 2002). These two issues are the focus of this section.

3.1 Sources of information

In the literature on career development, parents and other family members are among the most important influences, sometimes the most important (Grubb, 2002). Sometimes these influences are beneficial, for example when sophisticated parents can provide their children with perspectives on a wide variety of employment and on educational prerequisites, and when their own lives provide models. In other cases, the influences are surely negative in the sense of constraining the options to which a child can aspire.[13] In other cases parents lack the knowledge that might benefit their children.

The surveyed individuals were asked about the sources (and quality) of the information relative to the different career alternatives. They were asked to compare four different sources of information (information provided by parents, friends, teachers and others) on four dimensions considered to define the opportunities and challenges ahead: wages of the different occupations, difficulty of the careers, demand in the labour market and social value attached to the alternative professions. In general, we observe that parents are the most frequently used source. Here, we observe that they are also considered to be the most important in almost every dimension that defines an occupation. Specifically, the information that the individuals' parents provide in relation to wages, labor demand and social value is the most important. Although second after parents' information, friends stand as the most valuable source of information about a career's difficulty. These permits us to highlight certain implications. First, the previous generation's experience are fundamental and highly infuential. Second, friends[14] are the source of information considered to be the most authoritative, reinforcing existing social perceptions. In addition, the vacant space left by in-

[13] Constraints on aspirations occur in both high-status families — for example, when fathers pressure their sons to follow in their footsteps— and in low-status families, for example when parents pressure their children to remain in their culture of birth.

[14] Many times without being involved in the university experience or having a complete picture about it.

stitutional support and counselors induce young individuals to limit their search for information from those more easily or freely available.[15] This is particularly evident in the case of wages and labour market demands. In the remaining dimensions friends and teachers seem to have a bigger say. Table 5 summarize this information by different characteristics of the interviewed individuals.

3.2 Actions used to decide

As a first step in our attempt to understand the actions followed when searching for information and advice, our interviewees were asked to indicate their level of agreement with a variety of statements. Interviewees admit that occupation choice is something important enough to be worried about and, consequently, haved discussed the issue and received advice from different people.[16] However important and useful these efforts were, the same surveyed individuals state that they would like to have more information. In particular, they stress the importance of receiving information from those acquainted (either because of their training or occupation) with the particulars of those fields considered attractive. Table 6 presents this information.

In general, there aren't important differences between the level of agreement with the proposed statements by family characteristics or personal education background. Nevertheless, it is important to mention that those respondents who followed a technical track —more likely to be members of the lower socioeconomic stratus— during their secondary school are less likely to have discussed the topic with different individuals. This same group presents a higher proportion of individuals admitting their incapacity to gather relevant information about different careers. In turn, those who attended private schools and those who have more educated parents tend to feel more comfortable with the decision they need to take, being less likely to indicate that they still need more information.

As a second step, we assess the frequency with which the interviewees participated in different types of actions oriented towards arriving at a more informed decision. For this, we presented them with possible actions belonging to different categories such as conversations with their parents or friends, discussions with professionals or individuals employed in areas considered interesting, use of specialized publications and counselors and activities organized by educational institutions. Tables 7 and 8 allow us to observe the factors that influence the use of the different means, their relation with their self-reported possibilities and the statements just presented.

An emerging characteristic is that the interviewed individuals seem to have consulted with different people and combined an extensive array of suggestions. Nevertheless, the different means have important influences in their need (or not) for more information and further actions. In particular, we observe that those

[15] Tacsir (2010a) highlights the important role that parental education and occupational background have in the choice of scientific and technical careers by young individuals.

[16] This is evident in the information presented in Section 2.2.

		Most useful source of information about...			
		wages	**difficulty**	**demand**	**social value**
a. Personal characteristics					
Gender	Female	Parents	Parents	Parents	Parents
	Male	Parents	*Friends*	Parents	*Friends*
b. Educational history					
Type of school	Public school	Parents	Parents	Parents	Parents
	Private school	Parents	*Friends*	Parents	Parents
School track	Non technical education	Parents	*Friends*	Parents	Parents
	Technical education	Parents	*Teachers*	Parents	Parents
Performance in maths	Low	Parents	Parents	Parents	*Friends*
	High	Parents	*Friends*	Parents	Parents
Performance in language	Low	Parents	Parents	Parents	Parents
	High	Parents	*Friends*	Parents	Parents
c. University plans					
Type of career	Non priority	Parents	*Friends*	Parents	Parents
	Priority	Parents	Parents	Parents	*Friends*
d. Family background					
Mother's education	Without higher education	Parents	Parents	Parents	Parents
	With higher education	Parents	*Friends*	Parents	Parents
Father's education	Without higher education	Parents	Parents	Parents	Parents
	With higher education	Parents	*Friends*	Parents	Parents
e. Parents' involvement					
Help received	Low	Parents	*Friends*	Parents	*Friends*
	High	Parents	Parents	Parents	Parents
Awareness level	Low	Parents	*Friends*	Parents	Parents
	High	Parents	Parents	Parents	Parents
Concern level	Low	Parents	*Friends*	*Teachers*	*Friends*
	High	Parents	Parents	Parents	Parents
Total interviewees		Parents	Parents	Parents	Parents

Table 5: Main source of information about career's wages, difficulty of the studies, labour demand and social value of the professionals. Note: Italics are used only to make the exposition easier.

Agreement with statements about the choice	
Statement	Percentage
The choice is important enough to be worried about	90.6
I've discussed with several people and received advice	57.2
I'd like to discuss with somebody working on my field of choice	55.5
I'd like to have more information	43.8
I don't know how to get relevant information	18.7

Table 6: Agreement with statements. Main characteristics of the survey respondents. In percentages.

individuals who have been frequently involved in discussions with their parents are eager to receive further information from individuals working in their field of interest. Conversations with friends seem related with lower levels of confidence about the future. In fact, those interviewees that report a high frequency of engagement with friends are more likely to consider themselves unprepared for the coming university studies. Additionally, they tend to consider themselves unable to obtain accurate and current knowledge. Differently, those individuals who report to have participated in conferences and conversations with former students or professionals in their chosen fields tend to be less concerned about the occupation choice.

In addition, those youngsters who have consulted specialized publications (either magazines or books) feel less pressed by the choice ahead. These individuals have resorted to this strategy after feeling unease about the information provided at their own schools. However, although less worried they still believe that they are incapable of gathering their own information. Similarly, the individuals who have consulted vocational counselors tend to come from privileged backgrounds and didn't feel satisfied with the information received at school. Now they feel less worried about the decision and declare that they don't need further information.

In addition, we asked our interviewees about actions organized by their secondary schools or held during their class time. This is quite interesting since the actual time or number of events is an objective quantity that, by definition, is shared by many individuals. However, the assessment about whether these instances were frequent or not is an individual consideration. Hence, we can speculate that those youngsters that considered that either the time, visits of professionals or certain vocational tests were frequent tend to show good assessments of the information received there. At the same time, this higher frequency increases the self-reported level of preparation for the university and the likelihood of finishing the studies. Table 8 presents these results.

4 Long standing controversies

Different contributions focused on the implications that different endowments of professionals have in the countries' development path. In particular, Bau-

Individual strategies used to decide						
	Discussed with...		**Discused with people that...**		**Consulted...**	
	...parents	...friends	...studied the same	...work in the field	..publications	....counselors
a. Personal characteristics						
Gender				Male*		
Type of school						Private*
School track					Non technical*	
Performance		Good math*				Good math*
Parental Higher education						Father*
b. Information & future chances						
Information received at school					Poor†	Poor*
Level of preparation		Low†				
Likelihood of finishing			High‡			
c. Current situation						
Need for information		Yes†				No*
Able to get information		Unable*			Unable†	
Worried about the choice			Less*	Less‡	Less‡	Less†
Would like to discuss further	Yes†					
Have received advise	Advise‡	Advise‡	Advise‡	Advise‡		
Proportion (in %)	84.9	63.2	44.5	32.8	19.1	14.7

Table 7: Individual strategies used to decide according to individual characteristics and family background. Relation with future chances and agreement with propositions related with current situation. Note: Only reported factors that are significant for the χ^2 test for independence. Significance levels: * 10%, †5%, ‡1%.

Strategies used to decide provided by the schools			
	Time at school	**Vocational tests**	**Visits by professionals**
a. Personal characteristics			
Gender	Female*	Female†	
Type of school		Public†	
School track			
Performance			
Type of career	Non priority*		
Parental education		Father†	
b. Information & future chances			
Information received at school	Good‡	Good‡	Good‡
Level of preparation		High†	High†
Likelihood of finishing	High*		
c. Current situation			
Need for information			
Able to get information	Unable†	Unable†	
Worried about the choice	Less*	Less‡	
Would like to discuss further			
Have received advise			Advise†
Total (in %)	13.4	12.4	11.7

Table 8: Strategies provided by the schools used to decide according to individual characteristics and family background. Relation with future chances and agreement with propositions related with current situation. Note: Only reported factors that are significant for the χ^2 test for independence. Significance levels: * 10%, †5%, ‡1%.

mol (1990) and Murphy et al (1991) compared the effects of presenting higher proportions of lawyers and engineers on growth rates. Here, we included in our survey a set of questions oriented to this comparison by asking specific questions about rewards and demand for professionals for these two fields. We should take into account that despite both careers receiving a positive assessment by our interviewees and showing an almost identical behavior in terms of new enrollments in the last decade, they present impressive differences in the attraction they have for youngsters (see Tacsir (2010b). In this sense, we compare these two careers in terms of wages, prestige and contacts they enjoy. See Table 9 for details.

Individuals tend to present consistent assessments when are asked to compare these two professions. In particular, we find that those who followed a technical education or will follow a "priority field"[17], are less likely to believe that lawyers receive higher wages, enjoy more prestige or have better contacts than engineers. Those respondents that consider having contacts and the chosen profession are important determinants of individual success are more likely to believe that the opposite is true. As expected, almost every interviewee (90.2%) who believes that engineers receive higher wages than lawyers also feels that the engineers have higher social prestige (significant at 1% level for a χ^2 test for independence).

Additionally, we asked our interviewees to provide their opinion on a series of different statements in relation to the need for lawyers and engineers. In this sense, each of these statements receive (on average) similar levels of agreement: 17.9% and 21.0%, respectively (see Table 10). Although, the industry frequently states the need to increasing the enrollments in engineering,[18] we only find a small proportion of interviewees that agrees with its need. Interestingly, agreement with the proposition about a higher requirement for engineers is related with parental higher education. In the same line, we observe that 91.6% of those who stated that Argentina requires more engineers disagree with the notion of requiring more lawyers. Similarly, 90% of those supporting lawyers, disagree with the need for more engineers (significant at 5% level for a χ^2 test for independence in both cases).

On a similar line, we asked our interviewees to indicate whether they agree with the idea that being an engineering in Argentina is frustrating. Interestingly, and in opposition to the positive assessment made about engineering and its characteristics in terms of income, approbation and labor demand by the majority of the interviewees (see Tacsir, 2010b), we find a strong consensus about engineering resulting in a frustrating career option with an 78.2% of agreement.[19]

[17]Priority fields is a category developed by the Argentine federal government and includes the disciplines in the fields of natural and physical sciences, mathematics and informatics, engineering and technical fields.

[18]The issue has been taken by the media on different occasions. Different levels of government have reacted to the issue and currently there are several scholarship schemes restricted to students following ST&E disciplines.

[19]It should be noted that the prospective professionals from priority fields present the

Lawyers versus Engineers: perceptions on wages, prestige and contacts							
		Lawyers have higher/more...					
		wages than engineers		prestige than engineers		contacts than engineers	
		False	True	False	True	False	True
a. Personal characteristics							
Gender	Female	71.4	28.6	81.9	18.1	50.0	50.0
	Male	77.6	22.4	87.3	12.7	53.3	46.7
b. Educational history							
Type of school	Public school	75.3	24.7	87.9	12.1	51.4	48.6
	Private school	74.5	25.5	78.6	21.4†	53.9	46.1
School track	Non technical education	71.2	28.8*	81.5	18.5*	50.3	49.7
	Technical education	80.7	19.3	89.3	10.7	54.9	45.1
Performance in maths	Low	74.5	25.5	88.1	11.9	48.0	52.0
	High	73.5	26.5	83.1	16.9	52.7	47.3
Performance in language	Low	67.2	32.8	81.4	18.6	53.6	46.4
	High	75.4	24.6	85.5	14.5	50.2	49.8
c. University plans							
Type of career	Non priority	70.9	29.1†	82.8	17.2*	44.6	55.4‡
	Priority	82.6	17.4	89.9	10.1	69.0	31.0
d. Family background							
Mother's education	Without higher education	75.3	24.7	84.2	15.8	52.5	47.5
	With higher education	73.5	26.5	85.4	14.6	51.3	48.7
Father's education	Without higher education	73.9	26.1	86.2	13.8	50.3	49.7
	With higher education	75.0	25.0	81.6	18.4	54.6	45.4
e. Factors influencing success in life							
Profession	Not important	81.9	18.1	90.8	9.2	54.3	45.7
	Important	70.7	29.3†	81.9	18.1†	50.8	49.2
Social origin	Not important	75.1	24.9	85.9	14.1	52.7	47.3
	Important	72.7	27.3	82.4	17.6	50.0	50.0
Having contacts	Not important	79.7	20.3	88.1	11.9	56.8	43.2
	Important	68.4	31.6†	81.2	18.8*	46.3	53.7*
Total		**74.4**	**25.6**	**84.8**	**15.1**	**51.9**	**48.1**

Table 9: Level of agreement with statements comparing rewards for lawyers and engineers. In percentages. Significance levels for the χ^2 test for independence or two independent sample t-test:: * 10%, †5%, ‡1%.

		Lawyers versus Engineers: perceptions about country requirements			
		Argentina requires...			
		...more engineers		...more lawyers	
		False	True	False	True
a. Personal characteristics					
Gender	Female	78.8	21.2	73.5	26.5‡
	Male	78.8	21.2	92.1	7.9
b. Educational history					
Type of school	Public school	80.9	19.1	81.8	28.2
	Private school	85.3	14.7	81.6	28.4
School track	Non technical education	81.2	18.8	75.0	25.0‡
	Technical education	84.3	15.7	91.9	8.1
Performance in maths	Low	75.0	25.0	76.2	23.8*
	High	80.3	19.7	85.1	14.9
Performance in language	Low	78.9	21.1	91.5	8.5
	High	78.2	21.8	79.5	20.5†
c. University plans					
Type of career	Non priority	78.6	21.4	77.7	22.3‡
	Priority	79.8	20.2	92.2	7.8
d. Family background					
Mother's education	Without higher education	84.5	15.5	75.5	24.5‡
	With higher education	73.6	26.4†	88.6	11.4
Father's education	Without higher education	83.5	16.5	78.6	21.4‡
	With higher education	71.6	28.4†	91.7	8.3
e. Factors influencing success in life					
Profession	Not important	75.8	24.2	85.6	14.4
	Important	80.5	19.5	80.4	19.6
Social origin	Not important	77.1	22.9	84.9	15.1
	Important	83.1	16.9	75.8	24.2*
Having contacts	Not important	79.9	20.1	80.0	20.0
	Important	77.9	22.1	84.6	15.4
Total		**79.0**	**21.0**	**82.1**	**17.9**

Table 10: Level of agreement with statements comparing the need for lawyers and engineers in the country. In percentages. Significance levels for the χ^2 test for independence or two independent sample t-test:: * 10%, †5%, ‡1%.

Further on, we asked our interviewees to express their level of agreement with different propositions referred to careers related with science and technology. Specifically, we were interested in assessing to what extent the existing social perceptions assume that studying such disciplines requires either belonging to a rich family, to be really exceptional in terms of abilities and intelligence or have received an exceptional education. Obviously, a strong level of agreement with any of these statements will indicate a perception that, rooted into the youngsters mind, will constrain their options and keep them away from these scientific and technical disciplines.

In relation to the influences that different family background might play in the career orientation, there is an almost unanimous disagreement with the proposition that membership in a rich family is a prerequisite to be enrolled in ST&E careers. Specifically, although females tend to support this proposition, the general disagreement is almost homogeneously expressed without distinction among prospective fields of study. The unique exception are those planning to enroll in education studies (see Table 11).[20] In relation to the type of abilities required by these careers, a non-negligible proportion (26.5%) believed that they don't possess the level believed to be necessary. Only those inclined to natural and physical sciences disagree with the proposed statement (significant at the 10% level). All others, including those interested in engineering, present important levels of agreement. Those into social and human sciences and education studies have the higher proportions (both being significant at the 1%, also). As expected, those with lower performance in maths tend to describe themselves as less capable. In the same sense, those that believe that the chosen profession conditions the chances of success are also skeptical about having the required skills for scientific and/or technical careers.

However, and combining the previous opinions with the information reported in Table 11, the interviewees feel that the type and quality of education currently provided the secondary level school should take great part of the blame for the lack of necessary abilities. Specifically, 73.3% of the surveyed individuals believe that studying ST&E disciplines is difficult because of the poor level of the secondary schools. This perception is common to the aspirants of the different fields. However, the criticism is particularly strong in those individuals that highlighting the key to success resides in non-meritocratic features (such as having the right contacts).

5 Clustering of individuals

Individuals who make decisions based on imperfect information, uncertainty and biased preferences cannot be considered irrational, but rather boundely

stronger agreement with this proposition (91%, statistically significant at the 1% level), closely followed by those who followed a technical track at the secondary level (88%, significant at the 5% level).

[20] The aspirants to these same ST&E fields are the ones who are more discontent with the proposed statement.

		Careers in Science, Technology and Engineering					
		Studying careers related with science and technology...					
		...is for rich people		...requires skills that I don't have		...is difficult because of poor quality schools	
		False	True	False	True	False	True
a. Personal characteristics							
Gender	Female	95.5	4.5†	70.7	29.3	26.8	73.2
	Male	99.3	0.7	77.7	22.3	26.9	73.1
b. Educational history							
Type of school	Public school	95.6	4.4	70.5	29.5	26.8	73.2
	Private school	99.0	1.0	76.5	26.5	24.0	76.0
School track	Non technical education	97.0	3.0	68.0	32.0†	23.2	76.8
	Technical education	96.4	3.6	79.5	20.5	29.7	70.3
Performance in maths	Low	96.0	4.0	68.3	31.7*	23.8	76.2
	High	98.0	2.0	77.4	22.6	28.7	71.3
Performance in language	Low	96.6	3.4	88.1	11.9	29.3	70.7
	High	97.4	2.6	70.6	29.4‡	26.5	73.4
c. University plans							
Type of career	Non priority	96.2	3.8	68.7	31.3‡	25.6	74.4
	Priority	98.9	1.1	84.4	15.6	29.2	70.8
d. Family background							
Mother's education	Without higher education	97.9	2.1	72.6	27.4	31.5	68.5
	With higher education	96.1	3.9	74.3	25.7	22.0	78.0*
Father's education	Without higher education	95.9	4.1	73.1	26.9	28.5	71.5
	With higher education	98.2	1.8	77.1	22.9	25.0	75.0
e. Factors influencing success in life							
Profession	Not important	95.9	4.1	81.4	18.6	27.5	72.5
	Important	97.5	2.5	69.6	30.4†	26.3	73.7
Social origin	Not important	97.1	2.9	73.8	26.2	26.6	73.4
	Important	96.7	3.3	72.8	27.2	27.0	73.0
Having contacts	Not important	96.3	3.7	74.4	25.6	21.9	78.1†
	Important	97.8	2.2	72.5	27.5	32.3	67.7
Total		**97.0**	**3.0**	**73.5**	**26.5**	**26.7**	**73.3**

Table 11: Level of agreement with statements referred to careers in science, technology and engineering. In percentages. Significance levels for the χ^2 test for independence or two independent sample t-test: * 10%, †5%, ‡1%.

rational or subjectively rational. In the extended human capital model, those who (subjectively) value the benefits of education higher than its costs will make the investment, irrespective of whether this cost benefit analysis is based on one's current welfare situation, one's perception of costs or one's expectations about future returns. However, human capital theory does not explain why individuals possess different types of imperfect information and therefore differ in their subjective rationality. As a result, the theory does not satisfactorily explain why students from different socio-economic backgrounds make different educational choices nor does it indicate why monetary incentives appear to have an impact on some but not on others. Hence, the theory can't provide the reasons why some groups of individuals capable of entering higher education don't invest in it although all possible (objective) indicators show that it is one of the most advantageous investments to make, or why certain careers are not chosen by more individuals.

Previously we have shown that prospective students present different goals and objectives, are affected by different influences and decide to use different means to get information about the different careers. In this sense, even when information might be available freely (sort of a strong assumption on our view)[21] different individuals will make different use of it, will interpret it distinctively and, hence, will generate different perceptions (views) about the different options.

5.1 Methodology

We use Multiple correspondence analysis (MCA) to form clusters of individuals according to the expected rewards of the careers chosen by the interviewees.

[21]The most recent annual survey of 10,000 12-19-year-olds conducted by NatWest and reported by the English newspaper The Guardian on 30th March this year provides tangible evidence against it. Its results showed that teenagers think they will earn more than £50,000 a year by the time they reach 35, more than double the average salary of people in their thirties. In addition, the majority believe that will be able to afford a house by their mid-20s; only 14% of homeowners are aged 25 or under. At the same time, information even when available tends to be available for certain careers and not all. P. Romer (2000) reflects —after assessing the market for his own son— that most undergraduate institutions in the realms of science and technology don't provide useful information about labour market outcomes for degree recipients. To make this point even more explicit, he asked a research assistant to begin application procedures and request information about salaries for graduates for the top departments in ST&E in the US. Romer reports that no further information was obtained out of 60 initial requests. This contrasts with the 70% success rate for business schools. In the same sense, the emphasis put on guidance policies across the European Union wouldn't make any sense. In this sense, the CEDEFOP report (CEDEFOP, 2004, p. 13) express that "[T]here is widespread consensus that meeting the challenge of ensuring easy access to good quality information and guidance about learning and working opportunities throughout Europe and throughout citizens' lives is central to constructing a competitive, knowledge-based economy, to advancing active employment and welfare policies, and to social inclusion. Guidance, for instance, is promoted as one of the activities that operationalise the strategic goals set by the Council of the EU largely by assisting in broadening access to lifelong learning, increasing recruitment to scientific and technical studies, and motivating young people and adults to participate in and to continue learning." Similar views are included in the European Commission (2002) publication called "A new impetus for European youth."

MCA is a statistical technique that analyzes the interdependence among variables in a way that permits us to observe correspondences between qualitative variables describing a population. These correspondences emphasize independent latent factors. The interpretation in MCA is often based upon proximities between points (i.e., individuals) in a low-dimensional map. With this methodology it was possible to obtain four clusters according to the individuals' opinion about wages, social value and labor demand.[22]. Gender, type of secondary school (public or private), track during high school (non technical), parental education (either higher education or not), family income (constructed as high or low) were used as illustrative variables.[23]

5.2 Characterization

Each of the four clusters obtained using MCA presents some characteristic features (Table 12 offers a description of each class). The first cluster, named "Stable and Respected", makes up 37.5% of the total interviewees and the characteristic individual of this group believes that her chosen career is among the most demanded careers and believe it presents higher levels of social value. In relation to income, these have expectations that are similar to the average of our sample. Oriented mostly towards engineering and law, very few of the individuals in this cluster will study humanities and social sciences or education sciences. The second cluster ("Demand driven") is comprised of individuals who also believe in the strong demand for their career but, differently from Cluster 1, believes their university path would not convey social value. These individuals, 19.4% of our sample, are typically inclined towards Economics and are statistically unlikely to opt for architecture. Again, these individuals present income expectations that are similar to those of the total pool of interviewees.

In turn, Cluster 3 —called "Money driven"— is formed by youngsters who hope to obtain higher income but don't expect to be rewarded with social value or require strong labour demand. Mostly men, they come from highly educated households that, as expected, present higher income. Grouping 16.7% of our respondents, they are not particularly inclined towards or against any field of study.

Finally, the fourth cluster is formed by individuals whose expectations tend to be of lower income and weak labour demand, hence the label "Non demanding". With a stronger presence of females who followed non-technical tracks during high school, this group presents a big proportion of low performers in maths. Concentrating more than one quarter of the sample (26.4%), these individuals tended to opt for university careers in humanities and social sciences or in education sciences. Unlike the first cluster, there are few aspirants to engineering, law or health sciences.

[22]Each of these rewards was modified to consider either high or low values. Those in the higher groups of the first two variables present values that are higher than the average.

[23]An active variable corresponds to a variable that has contributed to the factor while an illustrative variable has not contributed with the factor but might be related with it.

Cluster of individuals: characteristics				
	Cluster 1 *"Stable and respected"*	**Cluster 2** *"Demand driven"*	**Cluster 3** *"Money driven"*	**Cluster 4** *"Non demanding"*
Expected rewards [1]				
Income	—	—	High	Low
Labour demand	High	High	Low	Low
Social value	High	Low	Low	—
Personal characteristics [2]				
Gender	—	—	Male†	Female‡
Track at school	—	—	—	Non technical‡
Performance	—	—	—	Low Math‡
Family background [2]				
Mother's education	—	—	High Education†	—
Father's education	—	—	High Education‡	—
Family income	—	—	High†	—
Expectations/income	—	—	High‡	Low†
University studies				
Typical career(s)	Engineering Law	Economics	—	Humanities & Social Education
Non typical career(s)	Humanities & Social Education	Architecture	—	Engineering Health Law
Type of career	Priority‡	—	—	Non priority†
n (%)=	112 (37.5%)	58 (19.4%)	50 (16.7%)	79 (26.4%)

Table 12: Main characteristics of the interviewees by clusters' membership. We only report characteristics that result significant performing a χ^2 test for independence. Significance: *10%, †5%, ‡1%. Notes: (1) Expected rewards were used as active variables to form the clusters. (2) Personal characteristics and Family background served as illustrative variables.

Similarly, the different clusters concentrate individuals with different opinions about the advantages conferred by an university education, the features that an career should provide to become attractive and the drivers for success. In relation to the motives ascribed for studying, we observe that those who are part of "Stable and respected" considers that higher education allows better reputation, in line with the importance that this cluster confers to social value. About the elements that makes a career attractive, this same group considers flexibility as the main feature, disregarding higher wages as an incentive to choose it. In turn, an big group (41.4%) of the "Demand driven" individuals opt for the pecuniary rewards uninterested in intellectual challenges. The "Non demanding" group is orientated towards the contribution to society but rejects the need for higher wages. In line with the mix of careers found in Cluster 3, we don't find statistical evidence of a preference for a certain feature to induce the choice. Table 13 summarizes this information.

In the same line, the different clusters present different opinions about the required assets to secure success in life. While the chosen profession is the factor behind success for those in Cluster 3, the "Demand driven" group highlights social origin as a prerequisite and those clustered in "Non demanding" feel this way about the possession of contacts. In this sense, the low expectations that characterizes this last group might be related to the belief that their lacking those social ties capable of providing them with more rewarding opportunities. The first group, on the contrary, tends to present the most meritocratic ideals: while doesn't highlight any factor as fundamental for success, they strongly disagree with the idea (held by Cluster 2) that social origin conveys an specific advantage. For them, the chosen career and not their own household is responsible for providing the material conditions for success.[24]

In relation to parental involvement and knowledge about the interviewees' performance in school, we observe that the "Non demanding" cluster stands out for reporting a low level of concern from their parents. In turn, the two first clusters exhibit extreme opinions about the knowledge of the parents in relation to their performance. While the group of "Demand driven" individuals express a low level of information, those belonging to Cluster 1 highlight a high level of information (see lower part of Table 13).

5.3 Opinions and goals' influences on future rewards

As mentioned above, parents are the most important source of information for every dimension considered (i.e, wages, difficulty, labour demand and social value). While Clusters 1 and 4 report the importance played by their own parents —showing the potential positive and negative side of this— this is not the case for every cluster and every dimension. In particular the group labelled "Money driven" seems to rely on sources of information different from their own

[24]It should be noted that the different clusters share the similar opinions about the importance of both intelligence and university studies for success.

parents. In fact, we observe a fundamental role for the "others" category and friends.

In relation to their current situation, the different groups also differ about their feelings in this respect. While similar proportions across the different clusters believes that the occupation choice is an important issue that deserves to pay attention to, Cluster 3 declares that would like to have more information (significant at the 1% level). In this sense, Clusters 1 and 2 are the most confident about the information they posses. This is related to the actions they followed to gather information. A large majority of the "Stable and respected" group declare that they have consulted with different individuals and received advise from them. As expected, Cluster 3 presents the smallest proportion of individuals engaged in such actions. In a similar sense, both groups "Stable and respected" and those grouped as "Demand driven" show a relatively smaller proportion of individuals who discussed further with somebody working on their same field of choice.

As expected at this point, the constructed groups will differ in the actions followed to decide what to study. Particularly, Clusters 1 and 3 stand at two extremes. Particularly, the individuals labelled as Cluster 3 exhibit the highest frequency of contact with counselors, have performed tests and have used books and/or magazines. This goes in line with the use of "Others" as the main source of information about the different careers (see Table 14 for this). In contrast, Cluster 1 ranks first in the frequency of conversations with previous students and established contact with people engaged in professions or fields considered interesting. We should remember that these individuals present the best consideration of the information offered at the schools, showing the highest frequencies of time devoted to discuss the occupation choice and talks about the topic held at schools. Table 15 summarizes this information.

Finally, we observe that the clusters differ in their assessment about the different propositions dealing with the comparison of lawyers with engineers and careers in ST&E. In particular, those individuals with more optimistic expectations about labour demand tend to consider engineers as recipients for higher wages. Those in the "Non demanding" cluster highlight the advantages of becoming lawyer, standing out as the only cluster that believes that the country requires more of these professionals. In the same line, they characterize the ST&E careers as something for the rich, requiring skills that they lack. In this last respect, the quality of the education received at the secondary schools is indicated as responsible.

6 Conclusions

The choice of a university career has a major impact on the future earnings and career opportunities of individuals. In turn, prospective university students make their decisions mainly motivated by expectations of future rewards. Hence, understanding career choices requires, first, to be able to understand the expectations that students have. Based on a survey at prospective university students

Careers, success and parents involvement				
	Cluster 1 *"Stable and respected"*	**Cluster 2** *"Demand driven"*	**Cluster 3** *"Money driven"*	**Cluster 4** *"Non demanding"*
To be attractive a career should provide	Flexibility†	High wages‡	—	Contribution to society†
Factors believed to influence success in life				
Profession			Important†	
Social origin	Not important†	Important†		
Contacts				Important†
Parental involvement and information about performance				
Awareness level	High awareness*	Low awareness*		
Concern level				Low concern*

Table 13: Opinions about what makes a careers attractive, factors influencing success and parental involvement by cluster. We only report characteristics that result significant performing a χ^2 test for independence. Significance: * 10%, †5%, ‡1%

Most useful source of information					
	Cluster 1 *"Stable and respected"*	**Cluster 2** *"Demand driven"*	**Cluster 3** *"Money driven"*	**Cluster 4** *"Non demanding"*	**Total**
Wages	Parents	Parents	*Other*	Parents	Parents
Difficulty	Parents	*Friends*	*Friends*	Parents	Parents
Demand	Parents	Parents	*Other*	Parents	Parents
Social value	Parents	*Friends*	*Other*	Parents	Parents

Table 14: Most useful source of information about wages, difficulty, demand and social value of the different careers. Note: Italics are used for emphasis.

	Individual strategies			
	Cluster 1 *"Stable and respected"*	**Cluster 2** *"Demand driven"*	**Cluster 3** *"Money driven"*	**Cluster 4** *"Non demanding"*
Discuss with ...			Parents‡ (92%) Friends * (66%)	
Discuss with people that...	studied the same‡ (55%) work in the field* (36%)			
Consulted...			publications‡ (35%) counselors * (18%)	
Performed...			vocational tests* (18%)	

Table 15: Strategies used to decide what to study by clusters. We only report strategies that result significant performing a χ^2 test for independence. Significance: * 10%, †5%, ‡1%. Percentages in brackets.

	Controversies			
	Cluster 1 *"Stable and respected"*	**Cluster 2** *"Demand driven"*	**Cluster 3** *"Money driven"*	**Cluster 4** *"Non demanding"*
Lawyers vs. Engineers				
Higher wages	Engineers*	Engineers†	Lawyers*	Lawyers$*$
More contacts	Engineers‡	Lawyers *	Lawyers*	Lawyers*
More prestige				
Engineering is...	frustrating‡			
Argentina requires more^{a}	Engineers†	Engineers*	Engineers*	Lawyers*
Careers in science and technology				
ST&E is for rich	No‡		No*	Yes‡
ST&E requires skills I lack	No‡	No*	No*	Yes†
School quality for ST&E careers	Obstacle*	Obstacle*	Obstacle*	Obstacle‡

Table 16: Controversies about careers in law and engineering and in ST&E by clusters. Significance for a χ^2 test for independence: *10%, †5%, ‡1%. Notes: (a) results the compare which career receives higher percentages of agreement between the two propositions.

in Argentina we first showed how individuals can be characterized in dimensions that are believed to affect their occupation choice: opinions about the role of higher education, factors that influence success in life, parents' involvement, sources of information and actions performed to decide what to study.

Based on the assessment of the rewards and requirements enjoyed by some paradigmatic careers —law, engineering and science and technology related fields— we find that both family and individual background affect the perception and expectations about the rewards offered by these careers. In particular, we find that those who followed a technical education or will follow a priority field are less likely to believe that lawyers receive higher wages, enjoy more prestige or have better contacts than engineers. It should be mentioned that those individuals who don't believe that individual merits are a prerequisite for success are more likely to believe that the opposite is true. A major reason for concern is that despite the vociferous public debate and different policy initiatives oriented towards increasing the enrollments in engineering in the country, we only find a small proportion of interviewees who state that engineering, scientific and technical fields provide more advantageous opportunities and rewards for their graduates. A factor that is worth mentioning here is that the level of agreement with this proposition is related to parental higher education. The combination of these two factors makes us believe that the individuals coming from underprivileged backgrounds when processing the market signals and the information gathered, results in downgrading the opportunities offered by engineering and technical careers. Hence, and of most importance to our interest, these negatively affect the pool of individuals following these careers (despite average market signals that would induce to do so).

On a similar vein, individual understanding of personal opportunities and options allows us to reconcile a seemingly paradoxical outcome: the fact that interviewees make a positive assessment of engineering and its characteristics in terms of income, approbation and labor demand at the same time that there is a consensus about engineering resulting in a frustrating career option. In this sense, we can speculate that the simple provision about the opportunities and rewards by the different career options isn't enough to attract growing numbers of individuals to engineering-related and scientific careers. Hence, bringing more students into scientific and technical fields requires attending to the heterogeneity in the population and how their diverse backgrounds get built into decision making. For this, those individuals coming from more underprivileged strata will require interventions that go beyond the simple provision of information but must also attempt to change the way this information is processed. The evidence presented using different clusters according to the expected rewards of the careers chosen by the interviewees confirms this finding.

Clustering individuals according to the expected rewards showed us that these clusters present identifiable characteristic features. In particular, the Multiple Correspondence Analysis highlights that those individuals who differ in their perceptions about their own future are different, also, in terms of the factors believed to secure success in life and the most important characteristics of their chosen career. Specifically, those who believe that their prospective stud-

ies are characterized by important labour demand and social respect —groups where we tend to find the future engineering students—, highlight flexibility as the main factor. Differently, those individuals who expect higher demand only consider that their career is attractive because of the high level of wages. This is the case even when the characteristic career of these individuals doesn't provide better income that engineering.

At the same time, we observed that the groups presenting different expectations have used different means to obtain information and advice about their future options. In this sense, those expecting high labour demand and social respect have based their decision on discussions with individuals who studied the same or are working on related fields. In this sense, the proactivity of the search for information and career advice in the form of tangible experiences prove to affect the youngsters perceptions. This is quite different from those expecting important pecuniary rewards who seemed to have been involved in conversations with parents and friends, standard publications and advise from counselors. This later aspect supports the common bias highlighted in the literature that vocational counselors have against scientific and technical fields.

Taking these observations into account, leads us to believe that standard policies oriented towards the simple provision of information will tend to be ineffective in attracting individuals towards ST&E areas. If the heterogeneity in the population produces heterogeneous results in terms of how individuals process the available information (corresponding to the average individual) we rather need to devise policies oriented towards enhancing the processing information of those underprivileged groups and those types of individuals specifically underrepresented in the ST&E areas. In particular, these new interventions in the area of career guidance and counselling should be focused in two complementary dimensions. First, we need to make life experiences available to the individuals about to decide. It is of utmost importance to promote the exchange of experiences of those graduates and professionals from groups of individuals less likely to choose scientific and technical careers. We believe that organizing meetings and talks by "role-models" would not only be an effective mean but won't require important resources. Second, there is the need to specifically train career counselors, avoiding them to transmit stereotypes and negative biases.

References

[1] Arcidiacono, P., Hotz, V. J., Kang, S. (2010), "Modeling College Major Choices using Elicited Measures of Expectations and Counterfactuals", *IZA Discussion Paper Series*, IZA DP 4738.

[2] Baumol, W.(1990), "Entrepreneurship: Productive, unproductive and destructiveÓ, *Journal of Political Economy*, 98, 893 – 921.

[3] Betts, J. (1996), "What Do Students Know about Wages? Evidence from a Survey on Undergraduates", *Journal of Human Resources*, 31: 27 – 56

[4] Betts, J. (1997), "Do Grading Standards Affect the Incentive to Learn?", Discussion Paper 97-22, Department of Economics, UCSD.

[5] Bourdieu, P. and Passeron, J.C.(1964) *Les Hńeritiers*, Paris, Editions de Minuit.

[6] Canada Millennium Scholarship Foundation (2006), " Closing the Access Gap: Does Information Matter?", Millennium Research Series Note No. 3. Montreal: Canada Millennium Scholarship Foundation.

[7] Canada Millennium Scholarship Foundation (2008), "Do Perceptions Matter Regarding the Costs and Benefits of a Post-Secondary Education?: A summary report of the research program Development of Measures of Perceived Returns on Investment from Post-Secondary Education".

[8] Ceja, M. (2004), "Chicana College Aspirations and the Role of Parents: Developing Educational Resiliency", *Journal of Hispanic Higher Education* 3; 338.

[9] CEDEFOP (2004), *Guidance policies in the knowledge society Trends, challenges and responses across Europe. A Cedefop synthesis report*, prepared by Ronald G. Sultana. Cedefop Panorama series, 85, Luxembourg: Office for Official Publications of the European Communities.

[10] Coleman, J., Campbell, E., Hobson, C., McPartland, J., Mood, A., Weinfeld, F. and York, R. (1966), *Equality of Educational Opportunity*, Washington D.C., US Government Printing Office.

[11] Dominitz, J. and Manski, C. (1996), "Eliciting Student Expectations of the Returns to Shooling", *Journal of Human Resources*, 31: $1-26$.

[12] Dominitz, J. and Manski, C. (1997), "Using Expectations Data to Study Subjective Income Expectations", *Journal of the American Statistical Association*, 92: $855-867$.

[13] Easterlin, R. A. (1995), "Preferences and prices in choice of career: The switch to business, 1972-87", *Journal of Behaviour and Organization*, 27: $1:34$

[14] Evans, K (2002). "Challenging Inequality, Choosing Inclusion: Higher Education in Social Landscapes" in A. Hayton and A Paczuska (eds.) Access, Participation and Higher Education: Policy and Practice. Kogan Page: London.

[15] Fiorito, J. and Dauffenbach, R. C. (1982), "Market and Nonmarket Influences on Curriculum Choice by College Students", *Industrial and Labor Relations Review*, 36, $88-101$.

[16] Freeman, R. B. (1971), *The Market for College-Trained Manpower*. Cambridge, Mass.: Harvard University Press.

[17] Freeman, R. B. (1975a.), "Supply and Salary Adjustments to the Changing Science Manpower Market: Physics, 1948—1973", *American Economic Review*, 65(1):27 − 39.

[18] Freeman, R. B. (1975b), "Legal Cobwebs: A Recursive Model of the Market for New Lawyers.", *Review of Economics and Statistics*, 57(2):171 − 79.

[19] Freeman, R. B. (1976), "A Cobweb Model of the Supply and Starting Salary of New Engineers.", *Industrial and Labor Relations Review*, 29(2): 236 − 48.

[20] Gambetta, D. (1987), *Were They Pushed or Did They Jump? Individual Decision Mechanisms in Education*, Cambridge: Cambridge University Press.

[21] Gordon, M. S. (1973), *Higher Education and the Labor Market*, New York McGraw-Hill.

[22] Grubb, W. N. (2002), "Who am I: The inadequacy of career information in the Information Age", OECD, August.

[23] Hossler, D., and Stage, F. K. (1992), "Family and high school experience influences on the post secondary educational plans of ninth-grade students", *American Education Research Journal*, 29(2), 425 − 451.

[24] Keith, T.Z., Keith, P. B., Troutman, G. C., Bickley, P. Trivette, P. abd Singh, K., (1993) "Does Parental Involvement Affect Eight-Grade Student Achievement? Structural Analysis of National Data", *School Psychology Review*, 22 (3), 474 − 495.

[25] Looker, D., and Lowe, G. (2001), *Post-Secondary Access and Student Financial Aid in Canada: Current Knowledge and Research Gaps* Montreal: Canada Millennium Scholarship Foundation.

[26] Manski, C. (1993), "Adolescent Econometricians: How Do Youth Infer the Returns to Schooling?", in C. Clotfelter and M. Rothschild, eds., *Studies of Supply and Demand in Higher Education*, Chicago, University of Chicago Press.

[27] Manski, C. (2007), *Identification for Prediction and Decision*, Cambridge, Harvard University Press.

[28] Murphy, K., Shleifer. A., and Vishny, R., (1991), "The Allocation of Talent: Implication for Growth,Ó *Quarterly Journal of Economics*, 106, 503 − 30.

[29] Schweri, J., Hartog, J. and Wolter, S. C. (2009), "Do Students Expect Compensation for Wage Risk?", *IZA Discussion Paper Series*, IZA DP 4069

[30] Sharp, S., Johnson, J., Kurotsuchi, K., and Waltman, J. (1996), "Insider information: Social influences on college attendance". Paper presented at the annual meeting of the American Educational Research Association, New York City.

[31] Sui-Chu, E. H. and Willmx, J.D. (1996), "Effects of Parental Involvement on Eight-Grade Achievement", *Sociology of Education*, 69(2), 126 − 141.

[32] Romer, P. M. (2000), "Should the government subsidize supply or demand in the market for scientis and engineers?", *NBER Working Paper series*, Working Paper 7723.

[33] Tacsir, E. (2010a), "Occupation choice: Family, Social and Market influences", *UNU-MERIT Working Papers Series*, 2010-014

[34] Tacsir, E. (2010b), "Choosing a career in Science and Technology", *UNU-MERIT Working Papers Series*, 2010-014

[35] Usher, A. (2005), *A Little Knowledge Is a Dangerous Thing: How Perceptions of Costs and Benefits Affect Access to Education*. Toronto: Educational Policy Institute.

[36] Varga, J. (2002), "Earnings Expectations and Higher Education Enrolment Decisions in Hungary", *Society and Economy*, 24 (1), 121 − 152.

[37] Vossensteyn, J. J., (2005), Perceptions of Student Price-Responsiveness, PhD-Thesis, University of Twente, The Netherlands

[38] Webbink, D. and Hartog, J. (2004), "Can students predict stating salaries? Yes!", *Economics of Education Review*, 23, 103 − 113

[39] van de Werfhorst, H. G. (2002), "A detailed examination of the role of education in intergenerational social-class mobility", *Social Science Information*, 41(3), 407-438.

[40] Xia, N. (2010), "Family factors and student outcomes", PhD Dissertation, Pardee RAND Graduate school series, RAND corporation.

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